UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/427,775	10/26/99	KIDD J	TUEC.IP2005

IM52/0705

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EXAMINER	
PADGETT, M	
ART UNIT	PAPER NUMBER
1762	7

DATE MAILED: 07/05/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/427,775	Applicant(s) Kidd et al
	Examiner M.L. Padgett	Group Art Unit 1762

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 4/5/01.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-103, 105, 110-114 + 117-133 is/are pending in the application.

Of the above claim(s) ______ is/are withdrawn from consideration.

☐ Claim(s) ______ is/are allowed.

☒ Claim(s) 1-103, 105, 110-114 + 117-133 is/are rejected.

☐ Claim(s) ______ is/are objected to.

☐ Claim(s) ______ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on ______ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on ______ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. ______.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: ______.

Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Interview Summary, PTO-413

☐ Notice of Informal Patent Application, PTO-152

☐ Other ______

Office Action Summary

1. *Applicant's election without traverse of Group I, method claims, plus the species of plasma plating, not including boat (crucible), ray gun, election beam gun, heat gun, chemical reaction or microwaves (as part of the filament) in Paper No. 6 is acknowledged.*

Effectively, via amendment and the above discussed election and excluded species, the elected species are, baskets or coils which can be said to be traditionally called filaments, and the heating process of passing an electric current through these evaporation sources (filaments), ie resistive heating.

2. Claims 1-103, 105, 110-114 and 117-133 are objected to or rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 129, the preambles are not commensurate in scope with the claimed steps, because no plating need be ~~cursed~~ caused by the plasma in the claimed limitations.

In claims 1 and 129, the independent claims appear to be saying that the mere heating of the depositant is what causes the plasma to be generated, however most practitioners in the art would have expected the D.C. voltage and/or the RF power to be the main contributing factors for forming the plasma, since heating does not generally cause ionization, and given the process limitations listed in the claims, so the intent of the method steps is confusing or ambiguous. While there is language in the specification matching that of the claims on p. 3 in the summary, there is also discussion (p.5, lines 10-20 and p. 32, lines 28-33) that imply otherwise. When current through a filament is used to produce heating (p. 10 of specification or claim 111), such a source

of energy has also been known to cause ionization, but the independent claims as written are presently scientifically inaccurate or confusing on what generates the plasma.

Claims 1 and 129 are further objected to as "the pressure" in lines 4, lack proper antecedent basis, as it is only just being introduced.

Use of "a" or no article for limitations that have previously introduced is objected to as confusing the antecedent basis of those limitations. Are they intended to be new (ie. unrelated) terms, hence need clear differentiation, or should they use the articles --the-- or --said--? In claim 1, line 6, see "a level" first introduced in line 4; in claim 2, see "a level" and "a rate" used multiple times, where both were first introduced in claim 1, lines 4-5; in claim 3 see " a voltage amplitude" (line 2), "a dc signal" (lines 3-4) and what is the intended difference between the claimed amplitude and the new limitation of "a voltage level" (line 4)? Is the language just inconsistent or is it intended to be a range for a different parameter? In claims 4-5, see "a power level" (lines 2 and 4, both). Why are entire previous ranges, and limitation steps being repeated? It only causes confusion, especially when proper articles for showing antecedent basis are missing, and can be said to be vague an indefinite due to the presence of 2 sets (or more) of ranges in one claim. Note that for example, 1-50 watts, always "includes" 5-15 watts, and that saying it does, does not necessitate the use of the narrower range. Other claims with antecedent basis and range problems analogous to clams 2-5, include claims 7, 51-52, 54, 121-125, 130, 132-133.

Claim 23 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the

claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It is unclear how calling a platform "a support structure" provides any further limitation, since that is essentially part of the meaning platform. The Webster dictionary definition of platform applicable to these claims is " horizontal flat surface usually higher than the adjoining area; also: a device incorporating or providing a platform".

It is also unclear how the features or orientations of claim 18-22 and 26 are intended to modify the claimed platform. Given the above definition thereof, and that neither p.11 of the specification nor any figures clarify this issue, it could be considered that somewhere in the platform (which includes the device incorporating a platform), there is a surface with the configuration claimed. If applicant intended to claim substrate holders with forms other then that of platforms, such is neither clearly disclosed or claimed. Note that while a platform is a support structure, a support structure is not always a platform.

Use of relative terms that lack clear metes and bounds is vague and indefinite, unless clear definitions are provide in the claims, specification or cited relevant prior art. In claims 32, 40, 48 and 51, see "desired" in "a desired location". Desired for what or by whom? When any evaporation source is used, it may be considered to have been put where desired when employed, and will be relative to any substrate coated. In claim 112, see "more even" (than what?), and in claim 114 "more uniformly" (than what?).

In claims 34-39, 42-47, 53 and 55, the words "base", "transition" or "working" is used before "layer," however no context in the claims provides these modifiers with any clear or

necessary meaning, ie. all the claims continuing these words merely read on deposition of a single layer (except in claims 53 and 55), such that there is no clear difference between claims that have no other difference. For example, claims 34, 36 and 38 as presented, claim the same limitations.

Claims 36-39 and 44-47 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. For reasons as discussed immediately above.

In claim 40, line 3 "the same type" is objected to as lacking proper antecedent basis, and is vague and indefinite because it is unclear what scope or range "type" covers. Does type refer to composition, shape, generic category of material or source, etc...? Also objected to is the introduction of "a...location" on both lines 2 and 5, with out any clear differentiation of term language, or the later occurrence showing antecedent basis.

In claims 41-47, "the evaporation source" can refer to either source discussed in clam 40, as the differentiation is incomplete. Note similar language in clam 48, presents analogous problems in claims 49-50, 53 and 55) for "the depositant".

In claims 49-50, "the weight" (all occurrences) are objected to as lacking proper antecedent basis. Furthermore, it is unclear how this weight is applicable. Do the weights claimed refer to the total weight of materials available for deposition (ie. the amount of available source material for the 2nd depositant is less by the claimed range), or to the weight of the compositional units, ie. the molecular or atomic weight?

It is noted that there is essentially no difference between claims 32 and 51, as they claim the same relative relationship, using relative terms.

In claim 52 line 5, "a temperature" is vague and indefinite as it has neither clear antecedent basis from the like term in claim 1, no clear differentiation, would modifying with --second--- be appropriate? Note analogous problems in clam 54. Also, in claim 52 "the prior plasma" lacks any antecedent basis, while in claim 54 "the second plasma" lacks antecedence due to dependence on claim 51, not 52.

Any frequency value can be given in either Kilohertz or Megahertz units, hence it is unclear what is intended to be the claimed ranges in claims 56 or 57. Is the kilohertz range 1-9 KHz or (0-infinite) KHz, or what? The examiner notes that claim 58 specifies 13.56 kilohertz, and while a standard industrial frequency is commonly 13.6 MHZ. Page 30 of applicant's specification confirms that the claimed units for this value appears to be as intended, although no reason why the claimed value is preferred is given (to the examiner's knowledge it is not an industrial frequency).

In claim 61, the meaning of "white metal clean" for a generic (or any) substrate is not known, so can not be effectively examined. While the specification uses the term on p. 22, line 28, it does not define its meaning. Claims 62-66, concern "Steel Structures Painting Council (SSPC)" standards, which while as discussed on p. 22, are not defined there, nor did applicants provide any literature that describes what these abbreviations, "SSPC-5" or SSPC-10", stand for, hence no

examination on these unknown procedures can be made. Note the "a defined standard" of claim 63, can be whatever anybody described they want, so lacking clear metes and bounds, is relative.

Claim 89 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The term "noble gas" represents the same set of elements as "inert gas", alternately "inert" in claim 88 is a relative term with no clear metes and bounds, ie. "inert" with respect to what? The specification was not found to provide any bounds.

Claim 102 appears to contain a typographical error, "a metal allow", in line 2. Also, the term "silver/palladium" is ambiguous as it is uncertain if the slash represents "or", "and" or "and/or", thus the scope is unclear.

In claim 110, "a support structure" of what? In claim 112, what is intended by "incremental staging of the current to the evaporation source"? How does one "stage" a current? Is it equivalent to ramping or pulsing or what?

Claim 114 is objected to, since "the completed" emphasis added) maybe considered to refer to "a voltage amplitude" introduced in clam 1, line 7, but is directed in the dependent claim to the current limitations of claim 111 or 113, thus may cause confusion.

In claim 117 "the addition" is objected to as lacking proper antecedent basis.

In claim 120 "can be controlled" is NOT a positive limitation, because it does not necessitate the stated action or effect ever taking place.

In claim 122, it is unclear how the terms in this claim “the pressure” (line 4), “level” (line 5); “ages” (line 6), “a rate” (lines 6-7); “a dc signal” (line 9); “a voltage amplitude” (lines 9-10); “a radio frequency signal” (line 12); “a power level” (line 11); etc... relate to the same terms that are present in the independent claim. Appropriate differentiation of the term limitation or use of articles to indicate clear antecedent basis is needed for the back sputtering (ie. sputter etching) step. Also, see clams 123-128.

In claim 128, “the rate of visible microarcing” is objected to as lacking proper antecedent basis. Also, what are the metes and bounds defined by “micro-” in microarcing”? Page 36 of the specification appears to indicate that microarcing is not actually referring to size, but is the name for the sparking effect of capacitive discharges that are occurring. Is this correct?

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-2, 4-6, 27-47, 51-81, 87-95, 98-102, 105, 110-114, 117-118, and 129-132 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grosman et al (5,078,847).

Grosman et al teach an ion plating process employing a combination of RF and DC power sources to bias the substrate, and may use an A.C. source to cause a filament surrounding the deposition material, to heat, melt and vaporize that material (abstract; figures 2-3; col. 5, lines 9-62). The process chamber is evacuated and an inert gas, such as Ar, is metered into the chamber

through a valve, where vacuum pressure of 4×10^{-4} torr (ie. 0.4 mtorr) or 4×10^{-6} (ie. 4×10^{-3} mtorr) are taught to be effected (col. 5, lines 11-21). It is not clear in Grosman et al exactly how these two pressures are related to each other and the addition of inert gas, however since it is conventional in the vacuum arts to achieve a base pressure, then add desired gas achieving an operating pressure, it would have been obvious to one of ordinary skill in the art to achieve a maximum vacuum (minimum pressure) at stabilized pressures as taught by Grosman, then add their desired plasma gases to achieve a useful operating pressure. All Grosman et al's pressures read on the two pressure ranges claimed by applicant, and 4×10^{-4} torr is when the gas introduction pressure range. Being the higher of the two taught values, would have been suggestive of an operating pressure to one of ordinary skill.

In col. 4, lines 10-28 and fig. 1, Grosman discuss -DC coupled with RF of 2-40 MHZ applied to the substrate, with 10-800 KHz applied to the source, as typical prior art ion plating, while Grosman et al connects a (+)DC voltage supply to the substrate (col.4, lines 60-68 and col. 5, lines 22+), with the RF power being described as typically "at a frequency of 13.56 kilohertz" (col. 5, lines 47-51). It is taught that D.C. source 26 (connects to substrate) controls the plasma field and that a voltage up to 400 volts may be used (col. 5, lines 35-42).

While Grosman et al provides no teachings on typical power level parameters for the RF applied to the substrate, it would have been obvious for one of ordinary skill in the art to supply such values via routine experimentation, depending on particular substrates (material, size,

dimension, etc.) that are being treated, hence values as claimed would have been expected to have been included in those effective, depending on the substrate being coated.

As indicated in fig. 2 and discussed on col. 4, lines 60-col. 5, line 5, Grosman et al teach the use of a capacitor 24A and an RF choke coil 27A, or other conventional means, when combining the RF and DC signals, inorder to prevent problems, such as shorting. This appears equivalent to applicant's claims of minimizing standing wave reflected power, as the specification discussion thereof (p. 31) provides the same types of means to achieve the end, and because balancing with the respect to impedance and electrical characteristic discussed therein, would appear to be equivalent in meaning to preventing shorting.

Grosman et al, teach material to be vaporized (is wrapped around a filament, depicted as a coil, and placed in the vacuum chamber. This configuration suggests wires, ribbons, strips, etc... Single or multiple filaments may be used, alloy formed, and vaporizing materials are suggested to include A1, Cu, Au, Pt, Ag, Ti and "other conventional vaporizing materials" (col. 4, lines 37-47, and col. 6, lines 21-24). While Cr, Sn, Ni, In, Pd and Pb are not specifically mention they are conventional, hence obvious as suggested. Distances between filaments and/or substrate and filaments are not discussed, but such parameters would have existed, and placements would have been determined via routine experimentation, where sizes and configurations of both substrates and sources would have been considered in determining relevant values.

While Grosman et al does not discuss cleaning before coating, it is a standard processing technique, because relatively few coatings, ion plated or not, will adhere well to dirty substrates.

Use of known industrial standards, when treating objects those standards apply to, would have been a conventional operation, hence obvious for their intended purposes.

As Grosman teaches inert gases (ie. noble gases) in general, as well as Ar specifically, use of any of the inert gases, He, Ne, Kr, Xe or Rn, would also have been obvious as suggested by the generic category, since the class of noble gases all have homologous chemistry.

Thickness of coating will depend on what is being coated, and desired effect, where the number of filament sources and/or separate sequential depositions will determine final thicknesses (col. 6, lines 12-20). Note that the suggestion of separate layers in sequence covers all applicant's multiple layer depositing claims, because none of the claims have any significant difference between any of the layers, ie. are as generic as Grosman teaching.

5. Claims 1-8, 15-28, 32-57, 59-81, 83-95, 98-103, 105, 110-114 and 118-133 are rejected under 35 U.S.C. 103(a) as being unpatentable over White (4,420,386 or 4,468,309).

Both White patents (386) and (309), teach ion plating techniques that use combined D.C.+R.F. sources to bias the substrate, and may use any suitable vaporization source, including filaments, with AC power sources to supply vaporized coating materials. Besides the illustrated filaments, refractory boats are mentioned. The examiner takes notice that tungsten(W), is a refractory metal, typically used for holding vaporization material, hence W-filamentary structures to hold evaporants would have been obvious types of filaments. The processes teach that no gas is required for ionization, however use of slight amounts of inert gas to provide uniformity over irregular surfaces is suggested, exemplified by Ar at pressure below the typical 10-20 microns (ie.

below 10-20 mtorr) needed for ionization. Therefore, it would have been obvious to one of ordinary skill in the art, to initially pump out their vacuum chambers, and then optimize the pressure at somewhere below 10 mtorr, via routine experimentation, which would have been expected to be inclusive of pressure value as claimed, as they are close to the values taught.

Precleaning of substrates, via plasma sputtering from inert gas ion bombardment is taught as a preparatory step (ie. the same thing as backsputtering), where the use of RF is noted to cause better cleaning than DC, where initial evacuations to 10^{-4} mm Hg (10 mtorr), then addition of gas to an exemplary pressure of 10-20 microns (10-20 mtorr), for cleaning is taught. While only the RF is noted as necessarily used for cleaning, use of the entire RF +DC combination of voltages when cleaning, would have been obvious, as it is shown as effective for providing ion attraction and even treatment of the substrate, which would also have been important for cleaning.

The White patents, both teach various fixtures or platforms for holding substrates, with (386) Fig. 1 & col. 2, lines 48-58 explicitly showing multiple (or arrays of) substrates; and (309) showing annular holders (58) or ones that include power rollers to manipulate the substrate (Fig. 7). Both (386) and (309) teach the possible use of multiple filaments, as well as possibly multiple coatings. White (386) specifically discloses evaporates of Au, Cu, Ag or Al; while White (309) has an analogous, but more extensive list including Au, Ag, Pb, Sn, In, Pd, Cu, Cr, Ti, metal carbides, metal nitride, ceramics and cements, with multicoating examples of layer sequences, such as Ti/TiC/TiN, with total thickness of 10,000 to 12,000 angstroms or individual

layer thickness that may be exemplified by 2000Å, 1000Å, 500Å, etc... Note how much of any one depositant one applies, will vary with desired effects and materials used.

White (386) or (309), apply a D.C. negative bias of 3 to 5 Kvolts, plus an RF bias source to the substrate, to attract positive ions of the plasma towards the substrate, while the filaments are resistance heated by A.C. being passed through them, thus causing vaporization of source material, which will inherently include heating to a temperature at or above the melting point. While no RF parameters are disclosed, one of ordinary skill in the art would have found use of typical standard industrial frequencies, such as 13.5 MHZ an obvious option, and would also have determined useful power levels via routine experimentation, taking into consideration important geometric and size factors that will effect power needed for effective and/or equivalent results (ie. the same power applied to objects with different sizes will have different effects, so amount of power applied to objects of unknown size, shape and constituents, has little significance by itself).

In White (386), see the abstract; fig. 1; col. 2, lines 28-38 & 48-col. 3, line 58; col. 4, lines 3-39; col. 5, lines 10-30, and claims 1, 4-5, 7-14. In White (309), see the abstract; figures 4, 5, 7; col. 2, lines 38-46 and 58-68; col. 3, lines 10-68+; col. 4, lines 49- col. 5, line 9 and lines 20-54; col. 6, lines 22-45 and 63-68+; col. 7, lines 38-48 and claims 1-8, etc...

Note that inert gas in general, and Ar as an example are again taught, hence reasons for obviousness of all inert gases are again applicable.

6. Claims 29-31 & 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over White (386 or 309) as applied to claims 1-8, 15-28, 32-57, 59-81, 83-95, 98-103, 105, 110-114,

and 118-133 above, and further in view of Grosman et al as applied above, particularly to claims 29-31 & 58.

While the White references teach combining D.C. and RF currents, they provide no specific electronic teachings on doing so, however the Grosman et al reference shows that use of particular electronic configurations, such as capacitors and the like, to prevent shorting damage, etc., would have been beneficial to any such mixed current sources, hence obvious to apply like safety features to the White references.

Grosman et al also shows that the specific frequency of 13.56 KHz (as opposed to 13.56 MHZ), is known for use in mixed D.C. & R.F. biasing during ion plating, hence would have been obvious to use for the White references unspecified frequencies.

Claims 8-14 and 117 are rejected under 35 U.S.C. 103(a) as being unpatentable over White (386 or 309) as applied to claims 1-8, 15-28, 32-57, 59-81, 83-95, 98-102, 105, 110-114 and 118-133 above, and further in view of White (4,667,620).

The White (386) or (309) references do not discuss rotating platforms for holding substrates for ion plating or coating without magnets, however White (620) which has an analogous substrate bias and filament source system, teaches <u>optional</u> use of magnets and substrate(s) on rotating platforms (abstract; figures 1-2; col.2, lines 54- col. 3, line 10 and lines 32- col. 4, line 10 and lines 37-55), hence it would have been obvious to one of ordinary skill in the ion plating art that rotating platforms and configurations as taught in (620) would have been expected to have been applicable to ion plating techniques of (386) or (309), because they use the

same principles to cause coatings in all references. Also note that White (620) specifically discusses the use of a commutator or a conductive brush for applying the bias to the substrate, via the substrate holder in reference #33 and col. 3, lines 5-10. Rates of revolution will depend on deposition rate, surface areas to be coated, substrate shape, etc., and be optimized accordingly. Note (620) also teaches coating possibly 500Å to 5000Å thick, showing like control capabilities.

8. White (4,673,586) can be considered analogous to (620) for the rejection of section 7 above, as it contains analogous teachings.

9. Claims 96-97 and 103 are rejected under 35 U.S.C. 103(a) as being unpatentable over White (386 or 309) as applied to claims 1-8, 15-28, 32-57, 59-81, 83-95, 98-103, 105, 110-114 and 118-133 above, and further in view of Mattox.

The White (386) and (309) references just discuss use of inert gases, but do not discuss other gases or reactive gases, such as O or N, however Mattox who is also practicing ion plating process, where an evaporation source that uses a filament is employed (figures, esp. Fig. 1; col 2, lines 63-col. 3, line 75+). Note that Mattox provides cumulative evidence for above discussed obviousness of W filaments and filament to substrate distances exemplified by 6 inches (col. 6, lines 61-72), as well as using pressures and voltages of interest, plus discussing cleaning (col. 4+). While Mattox also teaches ion plating using inert gases (Ar, He, etc.), a modified form of the technique uses a mixture of inert gas with some reactive gas to furnish a compound film (col. 6, lines 44-49), where example 4 on col. 7, lines 25-33 specifically suggest use of oxygen gas when forming Al_2O_3 and col. 8, lines 30-32 discusses any reactive gases, such as oxygen, nitrogen or

hydrocarbons. Therefore, it would have been obvious to one of ordinary skill in the art that ion plating techniques, such as practiced in White 386 or 309 would have been expected to be useful for such compound depositions, because Mattox has shown their equivalence process wise to non-compound metal depositions, and especially since White (309) suggest ceramics including metal nitride.

10. White (682) or (631) are equivalent to Mattox for teaching use of reaction gases in ion plating depositions, such as use of oxygen. White (4,826,365) and (5,252,365) are both cumulative to White (386 or 309) for showing that the alloy of Ag-Pd is a known and useful depositant for ion plated products, hence illustrate the above generically discussed obviousness.

The White (426), (416), 9401), Ide et al., Kakumoto et al, Yenawine et al, Hahn and Fujishiro et al, all cited by applicant have bias, filament and parameter teachings relevant to the claims.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over White (309) as applied above, alone or in view of Sakamoto et al.

While White (309) teaches that metal carbide films may be deposited, he does not mention anything about the source of the carbon in the carbide, however as White (309) teaches the possibility of multiple (2) sources of different materials, as well as deposits possibly being metal carbide, it would have been obvious for one of ordinary skill in the art to use one metal source and one carbon source, since generally they have lower melting and vaporization temperatures then their compounds, ie. metal carbides.

Alternately, hard carbon deposits are a type of ceramic coating, and Sakamoto et al shows that such C-coating may be formed via an ion plating process from evaporated carbon (abstract col. 1, lines 62- col. 2, lines 29), therefore it would have been obvious to one of ordinary skill in the art that ion plating with C-films would have been expected to be effective in the White (309) process, because Sakamoto et al shows that solid carbon sources are practical for ion plating therewith, and White generally suggest ceramics.

12. Any inquiry concerning this communication should be directed to M.L. Padgett at telephone number (703) 308-2336 on Monday-Friday from about 8:00 am-4:00 pm and Fax #(703) 305-5408 (official) or 305-6078 (unofficial).

Mpadgett:evh

06/26/01

07/03/01

Marianne L Padgett

MARIANNE PADGETT
PRIMARY EXAMINER
GROUP 1700